

THE CHEMIST

November, 1953

VOLUME XXX



NUMBER 11



DR. LLOYD VAN DOREN

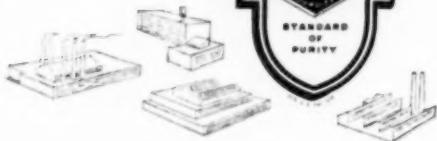
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(See page 499)



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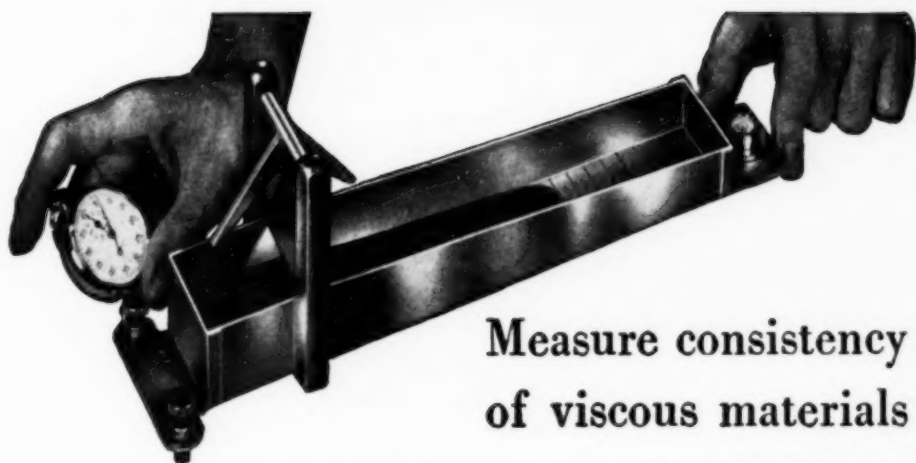
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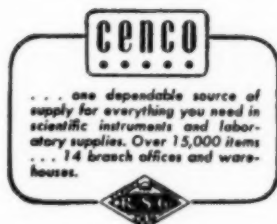
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COVER PICTURE

Dr. Lloyd Van Doren, re-elected secretary of THE AMERICAN INSTITUTE OF CHEMISTS at the 1953 Annual Meeting, was one of the founders of this organization in 1923. As a charter member, a committee member, and as secretary, he has helped the Institute to grow from that small handful of chemists and chemical engineers who envisioned the future to its present position of influence. Dr. Van Doren (Ph.D. Johns-Hopkins University) has taught at Lowell Textile School, been assistant professor at the University of Akron; professor and head of the Department of Chemistry of Earlham College, Richmond, Ind., and patent attorney with several firms. He has served for seven years on the Board of Education of North Plainfield, N. J., and five years as a member of the Town Council. Since 1931, he has been chemical consultant on patents and patent causes with Watson, Bristol, Johnson, and Leavenworth, New York, N. Y. He has long been active in professional societies and is also secretary of The Chemists' Club, New York, N. Y.

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EDITORIAL

The Employer-Employee Relations Committee

Dr. George L. Royer, F.A.I.C.

Chairman of the Committee

THE Council of THE AMERICAN INSTITUTE OF CHEMISTS has authorized the sending of this November issue of THE CHEMIST to college placement officers and at the same time include a reprint of a report by a former Employer-Employee Relations Committee on "The Employed Chemist and His Employer." This report, while written a number of years ago, contains much information that should still be of interest to the student looking for employment today. It was the thought of the present Employer-Employee Relations Committee that this could be made available to the students through the college placement offices. There are a few extra copies of this reprint, still available to members or students, that will be sent on request by the editor of THE CHEMIST.

The present Employer-Employee Relations Committee has held two meetings, one in Newark, N.J., and one in Chicago. One sub-committee from the New York-New Jersey area, consisting of L. H. Flett, A. R. A. Beeber, H. F. Wakefield, and G. L. Royer, is planning a meeting with

Our Thirty-first Annual Meeting

The 31st Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS will be held at the Berkeley-Carteret Hotel, Asbury Park, N. J., on May 12, 13, 14, 1954. The New Jersey AIC Chapter will serve as host. The general chairman of the Annual Meeting is David W. Young of Esso Research Center, Standard Oil Development Co., Linden, N. J.

the industrial relations heads of several of the larger employers of chemists in order to arrive at a program which will give a better understanding of the problems of both the chemist and those of industry. A second sub-committee in the Chicago area, consisting of H. S. Bloch, B. S. Friedman, and L. A. Hall, with the help of legal advice, is to study employment contracts. Any comment members may have in this area of professional relations will be welcomed by the Committee.

The Shortage of Supervisory Type Personnel

Dwight Moody

Chemical Editor, The Journal of Commerce, New York, N. Y.

(Reprinted through the courtesy of *The Journal of Commerce*)

ONE of the most serious problems facing top management in the chemical industry is how to assure an adequate supply of supervisory-type personnel to meet new needs being created by present and projected expansion programs.

Two approaches to the problem are indicated: (1) to interest an increasing number of promising students in a chemical industry career and to educate the public on the importance of chemistry and chemicals to national defense to guard against constant draining off the industry's most promising personnel material into military service; (2) maximum utilization of such trained manpower as is available.

Recent developments in the direction of swelling the number of potential trainees have been encouraging. Educational work of professional societies and other organizations at high schools and preparatory schools has been increasing the number of student enrollments in chemistry and chemical engineering.

Further, recent public opinion polls have revealed that a majority of the public favors deferment from the draft of college students of better

than average scholastic rating.

In other words, the public generally is aware — contrary to the contentions of some military men and politicians — that it isn't just rich men's sons that can get a college education; that scholarships are available for outstanding students who want to go to college; that the rich may be able to enroll their sons in college but their money doesn't buy for them scholastic rating or leadership qualities.

Thus, the outlook is favorable that a continuance of the educational work that has been started holds promise of providing an adequate flow of top grade students as trainees and for junior positions — and keeping them in the industry.

As regards maximum utilization of available trained supervisory and management type personnel, some revisions in present company policies might well be considered seriously in order to attain this important objective.

Leading companies, for instance, might well re-examine such policies as fixed regulations on compulsory retirement at age 60 or 65 and against hiring men past 40, no matter how brilliant they may be.

The compulsory retirement idea has been copied in some cases in the chemical industry from static industries which felt a compulsory retirement regulation would provide incentive for younger men who otherwise might be discouraged about chances for advancement.

But in the dynamic, fast-growing chemical industry, where the ratio of young newcomers to experienced men is exceptionally high, a policy that constantly weeds out some of the best men in a company may well prove not only wasteful but costly otherwise.

Similarly, in an industry where

men past 40, with training, experience and a disinclination to jump constantly from one company to another, are comparatively rare, there might be merit in re-examining company policy on age limitation on hirings that may be unfairly handicapping the employment offices. This applies even to research laboratories, where important discoveries, such as of Aureomycin, by men not only past 40 but past usual retirement age, have disproved the theory that only young men are creative.

NOTE: In this connection, another point of view is presented in the letter that follows.

Top Talent Dearth

(Name withheld)

(Reprinted through the courtesy of *Chemical Week*, New York, N. Y.)

THIS letter is prompted by the news article entitled 'Wanted at Once: Top Talent' . . .

It is very annoying to read repeatedly of the shortage of top-notch executive personnel when so frequently most able men find it extremely difficult to sell their services. (This does not apply to me as I am not in the position of seeking a job.) . . . But, I do know the details of some men's attempts to find executive positions anywhere near suitable to their past work and abilities.

Your report mentions one difficulty — the extremely tight specifications drawn for some of the top jobs —

specifications that are practically impossible to fill . . . I sometimes suspect that these tight specifications are deliberately drawn in order to cover up the real situation. Where a company has a system of promotion from within, it is very distasteful to personnel to have a man brought in from outside. Each top executive begins to wonder if a newcomer will take his job or make his job less attractive. Often the applicant is forced to be interviewed by a man who might think his job is in danger.

Another difficulty is that companies having pension plans hesitate to employ a man over 40 years old . . . un-

less that man is willing to forego pension benefits. Yet the qualities of rounded experience and leadership that are needed cannot usually be found in men in the lower age groups.

I chanced to talk with the head of an employment service in New York last week while I was looking for a couple of men. He agreed thoroughly with my analysis of the problem . . . He had before him records of many very high grade executives of proven worth—men who have been managers, vice-president, or presidents of important companies—who are now looking for connections because of consolidations or other reasons not connected with their own abilities.

I personally know of one man to whom I would entrust the fortunes of important companies in the . . . chemical field, but who has, so far, been unable to find a suitable position. He has a fine personality and a brilliant record. He is probably too good for the people who have interviewed him.

As I have said, I have no personal interest in this problem, but I think it's about time that someone takes the trouble to refute realistically some of these smug statements that industry is looking for top talent.

I agree that industry badly needs top talent, but if they want to get good men, they should overhaul their methods of selection . . .

*Comment on this letter by the
Editor of Chemical Week*

Industry is short of top talent—that is established and on that we agree; we are also sure that there is a good deal of top talent that could be put to use. Moreover, we agree with the writer that industry has not always gone about finding (or developing) men in the most efficient manner.

Nevertheless, management consultants agree that executives—who may be expert at marketing goods—are often woefully inept in selling their abilities. Clearly, both buyer and seller could ameliorate their problems by a more thoughtful approach.

NOTE: Now read "Placement After Middle Life," page 511 of this issue of THE CHEMIST.

Viscosity Standard: Adopted by the National Bureau of Standards on July 1, 1953: the value of 0.01002 poise for the absolute viscosity of water at 20°C, for the calibration of standard viscosity samples and viscometers. A similar standard has been adopted by The American Society for Testing Materials, the International Organization for Standardization, the National Physical Laboratory in England and the Physikalisch-Technischen Bundesanstalt in Germany.

Graduate Student: Joseph F. Gross, A.A.I.C., who has entered Purdue University.

To young men and women about to choose a career

As a member of the younger generation, you do not need to be told of the importance of chemistry in modern life.

You see its influence growing stronger every day—in news of improvements and developments in many fields . . . in better products and materials . . . in better food, clothing and health protection . . . in the creation of entirely new industries such as plastics and synthetic fabrics.

The chemical industry provides a fertile field of opportunity for young people trained in chemistry, engineering, medicine, biology, pharmacology and other branches of science.

Also because the chemical industry is

itself young and growing, it offers many opportunities for those with other talents and training—in accounting, selling, marketing, purchasing, production, business administration and other activities.

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A Scientific Approach to Professional Progress

Robert F. Moore

*General Manager, Richardson, Bellows, Henry & Company, Inc.,
1 W. 57th St., New York 19, N. Y.*

(A slightly condensed version of a paper presented at the 1953 Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS.)

A HEADLINE in the Sunday *New York Times*, May 10th, stated, "Brainpower Loss Imperils National Security." The story talked about serious shortages of engineers, teachers, scientists, and physicians. This referred to a report to be given May 18th by the National Manpower Council appointed by President Eisenhower while he was at Columbia. A White House memorandum comments that the report "opens the door to new and challenging issues of public policy involving more effective use of the country's human resources and development of potential skills and capacities from areas of wasted human ability." I hope we all have an opportunity to read this significant report because you and I have a share in doing something about it.

There is not one of us who does not have within himself the power to be more effective, to better develop his potential skills and capacities and stop wasting human abilities. Whether you are a boss, an employee, a teacher, a research worker, a graduate student — the challenge to you and

all of us is clear. That challenge is one of a more rigorous attention to our professional development and progress.

Everyday brings added evidence that specialized, executive, and professional manpower is in short supply. Management Development programs, designed to select and train potential personnel to offset managerial deficits, are being installed wherever one turns — almost to the point of being a fad.

The need is clear for more and better workers in all managerial levels and professional areas. Yet in our work as management consultants, we see many fine able individuals who seek help in changing jobs or who are in the employment market because of economic dislocation. They come to us seeking personal appraisal, a possible job with our clients, or career counseling. These are fine people with good abilities and often high potential. So often, however, they have been miscasts — the so-called square pegs in round holes.

Herein lies a paradox — on one side a terrific demand for brainpower,

on the other side brainpower going to waste. What can be done?

While management development programs are making considerable progress in answering this problem they have one great need in common — a management development program can be successful only to the extent that right men are chosen for development. Very few organizations feel sure about their choices of men for development. There have been many wrong choices and costly mistakes. Think of the great responsibility involved in the program of one nationally known company that has a budget of \$300,000 for sending potential managers to the advanced management courses at Harvard and Columbia. They must constantly ask themselves, "Are we sending the right man?" and "Have we overlooked a real potential future vice president?"

There is some hope that answers will be found to these questions as a result of research now being undertaken by several companies on a cross-industry basis. The objective is to learn whether more scientific procedures and techniques can be developed to spot the potential manager in advance and thereby insure better selection and development.

Thus, much is going on all around us that can have a profound impact upon your progress in your profession. What are you going to do to develop your own potential skills and capacities? According to various es-

timates, we work only up to fifty or sixty per cent of our capacities. Most certainly this leaves us a good margin for improvement in our personal effectiveness.

Chemists and engineers are like shoemakers' children who seldom take advantage of their opportunities. You are trained in the application of the scientific method to solve physical problems. Yet you rarely seek solutions to your personal or professional development by using the scientific approach. Most of your personal career decisions are made by hunch or the toss of a coin where you could have applied the scientific method to avoid error and to insure more successful professional development. The scientific method, as you know, involves defining the problem, gathering the facts, weighing the facts, seeking the best solution, testing it and then taking action.

There is no such thing as "status quo" in professional development — you either move ahead or you degenerate. This is particularly true of a dynamic field like chemistry where new developments occur everyday. There is no standing still. You keep up with your profession, or it passes you by. How much time do we have for further progress and where do we stand now?

The average span of a professional lifetime is said to be thirty-five years. This lifetime seems to sub-divide naturally into five-year generations.

A SCIENTIFIC APPROACH . . .

Thus, there is a move forward in the occupational life of an individual approximately every five years. These seven stages or phases may be labelled as follows:

Period

- 5 years—*Internship*, exploratory and training
- 5-10 years—*Proving ground*
- 10-15 years—*Consolidation* and advancement
- 15-20 years—*Critical opportunities*
- 20-25 years—*Peak years*
- 25-30 years—*Security Planning*
- 30-35 years—*Preparation* for succession and retirement

Ask yourself these ten questions by way of using the scientific method to assess your professional progress and future growth:

1. *What is your situation today?* Analyze your education, experience, skills and status in relation to today's job.
2. *How is your progress?* Appraise the quality of your professional performance to date, your progress and economic improvement.
3. *Have you an objective, and what is it?* Set realistic goals that will challenge all your abilities.
4. *What are your plans for reaching your objective?* Review your motivation, preparation and potential in relation to your aspirations.
5. *What additional personal development do you need?* Plan to strengthen your assets and eliminate your weaknesses.
6. *Are you making success a habit?* Keep success on a current basis — effective accomplishment of each day's assignment is true success.
7. *What about the boss?* Your professional progress is a fifty-fifty affair, and will be enhanced by strong leadership and association with a well-managed organization.

8. *What about your associates?* An enthusiastic following of friends, associates, and those under your direction, is necessary insurance for your progress.
9. *Have you defined your basic philosophy?* Establish a set of principles or personal policies and dedicate yourself with zeal to their daily application.

Lastly,

10. *Have you a time table for progress?* Make a schedule and control your time for it is your most valuable asset.

Recently our good friend Sidney Kirkpatrick, editorial director of *Chemical Week* and *Chemical Engineering*, and I were talking about the great need for broadly qualified top executives in the chemical industry and decrying the scarcity of such men. Sid used a rather graphic illustration to describe what is happening in the industry. People, Sid says, are coming up through vertical ruts. Thus a research man stays in research and development, an engineer sticks to production, a salesman stays with sales, and so on. This is good up to the time that a company needs a general manager, executive vice president or president, at which time they have only specialists to choose from. At this point a likely candidate from Sales is usually rushed off to Harvard Business School for thirteen weeks of advanced management training.

Both as individuals and as companies, we should think more about ways and means to develop broad generalists out of our specialists.

The scientific approach, among other steps, calls for a blue-print. Here is one for you:

GOAL

Annual Check-up Experience Training Self-Appraisal
Proper Placement Right Job, Right Field, Right Employer
Adequate Preparation Education
Y O U Intelligence, Health, Ambition, Attitude, Drive, etc.

And along the way, strategy and breaks, ability and time, and friends.

We are in an era demanding more and better leaders in business and the professions to meet the complexities of a changing world — and we are told there is a great shortage of leaders, managers, executives. In this fact lies your opportunity if you will prepare yourselves by applying the scientific method to your professional progress.

Moved: Emmet Technical Associates to 92 Liberty Street, New York 6, N.Y. Mark M. Luckens, F.A.I.C., is director. Felix Konstandt, M.A. I.C., formerly chief chemist, Pittsburgh Testing Laboratory, has been appointed director of the Analytical and Evaluation Section.

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"... The last of life, for
which the first was made."
—Rabbi Ben Ezra

AS THE years take their toll in energy, the older worker finds the value of his life enhanced by his accumulated experience. All too often that is not recognized. Short-sighted managements see economy in staffing with younger men; and, without the balance of youth and maturity, they fail in achieving their best goal. Other organizations may find that too many men have grown old together and they need young blood. Changes in management or ownership often lead to reorganizations, with the result that some of the older men are out of work. The decadence of an industry and its displacement by a new and drastically different one creates technologic unemployment. There thus becomes available skill and experience that only the years can build. To place such men in other organizations presents problems in personnel relations and is often prohibited by insurance and annuity rules. What each one should do for himself about this problem begins many years before it presents itself, and it is not too early for the college graduate to give some thought to it.

Rather than set his sights on salary without consideration of the compensating experience, a young man would

do well to weigh both in their proper perspective. His choice of field should be one that has potential growth or at least long years of probable stability ahead. In advice to one young man about two jobs of equal present worth, the point was made that one of them had the advantage that it should prepare him better for service in later life; and, on that basis, he took it. Not all men can place under such circumstances. There are other ways to meet the problem, as through the use of outside hours for study or for building acquaintance. Membership in professional and scientific societies, with participation in their activities, is a basic essential for both technical and personal growth. It is a means of keeping informed about the trends of an industry, so as to be prepared for the anticipated changes. This also becomes an occasion to learn about new fields of opportunity as they develop. Through friendships and acquaintances in the profession, there is the basis for co-operation with each other in a spirit of helpfulness. Interests outside of the profession, such as hobbies and community activities, are also an asset both for growth and for usefulness.

"Blessed are the meek, for they shall inherit the earth." These words from the Sermon on the Mount are

often misunderstood. The meek are not the weak; they are those who are mature. Failure to attend to those things which develop and broaden a man over the score of years after graduation can make suitable placement difficult if he loses his position in middle life. On the other hand, twenty years of growth after college will mature a man to meet whatever may befall. He will have the confidence to move out of untenable environs; and, instead of being beaten down the rest of his life, he will be attractive to others who can help him continue his progress.

Companies can do much to better the situation. The choice of top executives who possess true worth rather than choice purely from pressures of business or family connection is vital in many more ways than this one problem. New executives brought from outside sometimes feel weak and uncertain until they prove their strength by firing someone. A very competent president of a large company expressed himself differently. In making a career of leading sick companies to fortune, he has found it unnecessary to fire men. With reasonableness, he seems to make all men useful. To him, the thing of importance is that his board of directors must be willing to work harmoniously and effectively toward the goal for which they hire him. Besides providing competent executives, a company owes it to each employee to make

each year he is with them count toward tangible economic protection for the years ahead whether he stays with the company or not. In the present economy, with taxes as they are, it is not possible to expect many workers to set up their own protection. Social security is a help; but it is not adequate for all the needs, and it does nothing for one in the years before age 65. Further, a company can be of great service in specific severances. It can arrange recompense based on years and kind of service to extend for a suitably long time after the employee has left. Better still, it can guide the employees to others while he is still working; and that can be truly friendly help as well as practical in that it may avoid the need for the man to sell his know-how directly to a competitor in order to live. Above all, it should not try to save face when a good man leaves, by some attack on character, of which there is an example in the Astin case.

It has been a privilege to advise with many in their forties and over who need a new position. Their problem is quite different from that of the younger men who are locating anew. These older men have established living standards which are hard to lower. Most of them do not really know how to hunt for a position. Often their backgrounds are limited to the work at which they have spent many years. Then, the time ahead in which to achieve anew

PLACEMENT AFTER MIDDLE LIFE

is short. Fortunate is the man who possesses some useful technical skill or knowledge of a field which he can apply in a different way with others, and whose financial position is such that the threat of destitution does not exist; and rather that he has capital if it becomes essential to his new efforts.

At the time of severance, the man is faced with an adjustment problem of major proportions. He ought to rest and place himself in the calm position to think clearly, if he has not already made plans. A few good friends can help him by intimate private discussions. They can view things more objectively, and their suggestions should be good. Some management consultants, operating in the rating field — either with tests or interviews — can help in the self-examination. All of these things point to the direction in which the man should head. It is an essential part of the readjustment to get an objective answer to the problem of where to go and what to do.

To men who have not been compelled to "sell themselves", the steps to take and the appeal to make are unfamiliar. There are a number of techniques to be tried. One is the employment agency which has position listings of personnel being sought. They have standard fees, the limit of which is fixed by law, which are to be paid for successful placement. An employer may assume the

obligation, but it is not often wise to ask him to do so. Then there are management consultants, who serve their client in a search for personnel. It is good to see several of them, as it is only by chance that they will be searching for a man's particular qualifications. The college placement bureau may be of assistance. Then, there are the societies which have a placement service. The American Chemical Society does good work in helping employer and candidate to meet. Advertisements in technical and professional publications may be used to find an employer, and a man may advertise that an employer may find him. Local newspaper advertising is generally not good except in the large cities. In recent times, there have been many offerings in the more widely circulated papers, and these are often from out-of-town. There is danger in the advertisements placed in a competitor's hometown paper, as placement may create a compromising situation.

In several of the larger cities, there are organizations known as the "Over 40 Clubs". Applicants are elected to membership after careful scrutiny of records and references. Then they participate in the office and field work. They become acquainted with their associates. In the field, it is their job to sell some other member for a position. They may not solicit for themselves. The Clubs cover a wide range of experience, and

only a limited number of the membership comprises technical manpower. It is an interesting and effective approach to this problem.

To meet the prospective employer or to arouse his interest by mail, it is desirable to prepare a personal and professional record. This should contain information on name, address, age, citizenship, family status, photograph, academic training with degrees and years graduated, societies, clubs, hobbies, and the like, along with a section fully developed to show experience. This last would list positions with dates, and it is well to show what was done without a gap since college. Each position should be described and the degree of responsibility and the achievement briefly stated. A record of salary growth and increasing responsibility helps. Fortunate is the man with a "Vanity File", a record similar to the Army's 201 file, compiled over the years of his experience with the essential items noted as they occurred. References are needed, and the record should contain a number of names and addresses of those who have known the man in business or in private life. Specific references may be supplied later to answer any special questions developed with a prospective employer. The entire record should be objectively and clearly stated so that it will be verified by former employers. This record should be set up in a style in keeping with one's position in life.

Men of some stature often find it in a suitable cover. Overdone or garish records and plain mimeographed records represent extremes to be avoided by the man of experience. Then it is hoped that, after all these steps, the few employers who want just this kind of experience will discuss all the aspects intimately and a happy decision will be made.

Others who have seen the demoralizing effect of too dominant leadership may want to be their own bosses. This choice requires careful study. One must possess the talents and resources to do what he wants to do. The risks are great, but there is good reward for those who succeed. Still others may find in early severance a chance to try another area, perhaps growing out of a hobby. Those added available years afford a good chance for success.

Life may bring its points of major decision. Being resigned to one's fate is no answer. Happy is the man who sees the way for him to go and does it. He can say

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The Chemist, His Profession and Public Relations

Dr. H. B. Hass, F.A.I.C.

*President, Sugar Research Foundation, Inc.,
52 Wall St., New York 5, N. Y.*

(Excerpts from a talk presented at the Symposium on Public Relations for Chemists, held jointly in New York by The American Chemical Society and The American Institute of Chemists.)

WHAT do we mean by a profession? A profession is an occupation in which one ministers to the public by the use of superior specialized knowledge. We note two criteria. The first is ministering to the public. Here we encounter a division of opinion among chemists. One group feels that only the self-employed chemist is truly professional. The rest are sub-professional wage-slaves.

"Not so," says the chemist employed by a company. "We serve the public indirectly. We have given the public nylon and terramycin and chloromycetin and a thousand other triumphs of chemistry which make life safer and more comfortable."

Now words mean what we agree that they shall mean by the common usage of educated persons. Since consultants are a small minority of chemists they will always be outvoted on this question and so we must include chemists as professionals whether they serve the public directly or indirectly.

As for the second criterion, the

"use of superior specialized knowledge," there can be no reasonable doubt. One of the principal reasons for the shortage of chemists is that chemistry is a difficult subject and only a relatively small percentage in any population has the combination of intelligence and persistence required to master it.

What are the principal problems in the public relations of a chemist with his profession? Of several ways to approach this problem, I have chosen first to discover whether there is any well-recognized personality profile which fits the typical chemist, and then to postulate the sorts of strengths and weaknesses that would be expected in the professional relations of such a person. Fortunately psychologists have done some work on what kind of a person a chemist is.

What kind of a person is a chemist? Chemists are people and people vary from one another. We learned about Maxwell's distribution Law when we studied the kinetic theory of gases. There are, however, definite ways in which chemists vary from

the average citizen to a degree of importance.

Chemists are well above the average in intelligence. They rate definitely above executives for instance. The chemist has far more than his share of curiosity. He is in most instances far above the average in creativeness. He has gone to school much longer than the average. He has developed in some degree the character trait of departing from the conventional; you will find more chemists than lawyers going without hats in summer. Chemists and other scientists place a greater emphasis upon intellectual honesty than most people do. They are more willing to keep on learning and to accept change than others of their own age and they are more international in their outlook than the average citizen. They are only fair in ability to communicate ideas. With numerous outstanding exceptions, chemists are more introverted than the average person.

What sort of professional relations would be expected of a person with the personality profile just sketched? What would we expect of the professional relations of a chemist which derives from high intelligence? Well, for one thing, he has to be careful to avoid offending others by giving the appearance of a feeling of mental superiority. One of the most disruptive influences in a laboratory is a certain type of intellectual snobbery.

This can be real handicap to a chemist. He may antagonize the plant workmen who can express their feeling by failing to cooperate. He may reject good suggestions from others with less education. He may be hard to handle because he is more intelligent than the executives who are above him in the organization chart, but not quite intelligent enough to know that in any organization the power to direct must accompany the responsibility for results.

Three years ago the non-technical president of a large chemical company suggested a problem of transcendent practical importance. He urged the development of a practical and economical process for obtaining fresh water from ocean water. From the remarks of certain Ph.D. chemists one would have supposed that the idea had no prospect of success. Since the recent announcement of a new electrical method of doing exactly what was suggested, the chemists have refrained from discussing this, but I have no doubt that they will be just as certain next time that only a chemist can imagine what a chemist should do research on. This is most unfortunate. Chemists are the only people who can solve chemical problems but anyone can propose a good research subject. In fact, good subjects for research are more likely to come from a non-chemist than from a chemist — there are more non-chemists.

The chemist is a naturally curious person with an undying zeal to know more about the universe around him. Conversely, he is usually willing to help satisfy the curiosity of others by presenting the more interesting of his own discoveries. One of the greatest incentives for doing research is the acquisition of a greater understanding of how, and even why, the phenomena of nature are as they are. Even this laudable impulse may lead to difficulty. Chemists have become so engrossed in a fascinating scientific problem that they kept on working long after the economic justification for the effort had disappeared. We chemists should never try to suppress curiosity; it is one of our most important emotional drives. But emotions, even the best, need to be controlled.

The chemist is creative; some much more than others. Until recently it has been customary to contrast the analytical chemist who merely discovers what is there from the creative organic chemist who produces molecules that never before existed. This distinction should be abandoned in view of the amazing series of electronic and other devices that have been invented and developed by the modern analytical chemist.

It is typical of creative people that they can be led but not usually driven, that they are somewhat temperamental, impatient of restraints and unwilling to punch time clocks.

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They are in some degree often emotionally immature. This may be overemphasized, but if we try to remember that chemists, in some respects, are more like artists and writers than they are like the conventional stereotype of a scientist, we may save ourselves disappointments.

The chemist not only is highly educated but he must keep on learning continually if he is to reach and maintain maximum usefulness. One of the Grand Old Men of American chemistry, Prof. E. Emmet Reid, Hon. AIC, said, "During most of my life I have tried to become an organic chemist. And now the literature with which I am totally unfamiliar is ten times as large as it was when I started!"

We have all had the experience of seeing a difficult problem yield to a thought made possible by just one additional fact. A consultant was confronted with a reference that mentioned a solution of cellulose nitrate in ether. Cellulose nitrate will not dissolve in ethyl ether. But the U.S.P. ether at the time of the reference contained alcohol. A little additional

knowledge solved the problem.

Yet there is hazard here also. Creative thought seems to depend upon arranging ideas into new patterns. It can happen only if the ideas are in the same mind at the same time. But too great a preoccupation with the acquisition of ideas is detrimental to the proper attention to the rearrangement of ideas. We need balance here. It is also possible to achieve creative sterility by knowing too many things that won't work and hence are never tried. Many exasperated research directors have complained about chemists being unwilling to try something which has been given a half-hearted attempt and from then on is left severely alone. How could Reppe chemistry have been started in a modern laboratory where all the chemists would know (1) that a vinyl chloride would not react metathetically with sodium alkoxide and (2) that acetylene would explode if heated under pressure? Only because Reppe did not know the first statement did he learn that the explosions could be suppressed. In certain circumstances ignorance can be a precious asset.

The chemist is unconventional about minor things. In general, I'm all for it. It would be a stuffy world if we all dressed exactly alike and had the same interests and hobbies. A really valuable chemist is one who has learned to think for himself and is proud of it. Human relations are

smoothest with people who have the same outlook and prejudices — however irrational and foolish they may be. A person who is continually getting new ideas and who has learned by experience that many of his ideas are sound will not for long fit into any conventional pattern. The dissenter is by nature a hard person to get along with and yet if we want progress in science and invention, we must have dissenters. Research direction is such a difficult art because it involves getting teamwork from individualists without crushing their originality. Yet when a chemist goes into an employment interview without a tie and dressed sloppily he hurts himself and does little to enhance the reputation of the profession. In some degree we must regard the opinions of others even when they seem irrational.

There is another obstacle to good human relations of chemists. In science we learn by observation and experiment only to the extent that we are intellectually honest. If the molecules insist on behaving contrary to the predictions of our fondest concepts we are willing to embark on another hypothesis. The effect of research on the character and personality of the researcher would constitute a fascinating area for psychological study. Among all of the diversified people who become scientists, their essential honesty seems to stand out as the one trait which almost all of

them have in common. For this reason, we are unusually severe in our attitudes toward anyone who we think is guilty of even a slight distortion of the truth. We are keenly distressed if anything we publish does not stand up under the critical scrutiny of repetition in another laboratory. This is all to the good. It leads to a problem, however. Human relations, as they have developed in our civilization, are to large degree insincere. We are so accustomed to this that we hardly realize it.

Ambrose Bierce defined a bore as, "A person who talks when you wish him to listen." It is not likely that everything that we hear at a symposium will be interesting to any of us, but each will disguise that fact with whatever skill he has for dissembling. I am suggesting that the exacting emphasis upon honesty, which is the necessary and desirable attribute of every scientist whom we respect, also creates problems in human relations. We have to learn to tread the narrow line where tact and honesty meet.

The chemist is more international in his outlook than the average citizen is. This is in part the effect of intelligence and education and in part the result of learning to admire the scientific contributions of other countries. Chemistry is a truly international language. An international congress of chemists cooperates enthusiastically when our diplomatic



counterparts are completely stymied. Yet not even scientists are wholly free from national, racial, and religious bias. There is room for improvement here and a wise research director will recognize the importance of unjust discrimination even when he uses what influence he has to oppose it.

One of the elements of public relations is communication. Here the chemist rates only fair, well below where one might expect from his general intelligence. It is a chronic complaint among industrial chemists that our young Ph.D.'s who come out of college cannot write an acceptable report. Some of this criticism is unjustified, perhaps, and means only that the particular prejudices of the research director have been offended. Grant also that sometimes the young chemist is too ignorant of the background of the problem to write a good report, however skilled he may be in written English. Make all the allowances you can and there is still a hard residue of fact. The attitude: "Us engineers don't need no English", is

only half a joke and extends to chemists.

Lawrence H. Flett has pointed out that the science of chemistry grows steadily more complicated while the number of years devoted to its study remains constant. It may also be pointed out that because of differential fecundity among various groups in our population, the average I.Q. in America is believed to be decreasing by about one point in ten years. Thus while chemistry becomes more difficult the average student is no brighter and the human relations aspect of a chemical career are increasing in importance.

The remedy usually suggested for poor writing — more courses in English in school — should be seriously questioned. The average English instructor could not write an acceptable scientific report and would not be interested in doing so if he could. The typical student has been learning English in and out of school for twenty years when he obtains his first degree and has virtually reached an equilibrium where he forgets what a gerund is while he is being taught that he either (1) should not or (2) may use a split infinitive, depending upon who is speaking. It is still more futile to expect that the study of foreign language will be of great help. So the young chemist can say, "This is the cat of my aunt" in French! He still can't write that report. The way to learn report writing is, curiously,

to write reports. If all of us industrial chemists insisted on good, frequent research reports on fellowships which we administer, the relative neglect of scientific writing would be significantly ameliorated and the students' research would benefit from the compulsory periodic review.

Finally, chemists are introverts. A discipline as difficult and exacting as chemistry inevitably attracts a disproportionate number of persons who possess the primary personality trait of being "withdrawn" rather than "participating." I use the terms in the sense of Dr. Raymond B. Cattell who has made an elaborate statistical study of personality. It should be pointed out that not all chemists are of the withdrawn introverted type. We are acquainted with such men as Walter Murphy, Marston Bogert, Raymond Kirk, and Herman Mark, to mention just a few of the opposite kind of chemists.

What is of importance is that youngsters who are not unusually successful in their human contacts, who don't like people, or who don't handle people well, make up for this lack by studying hard and excelling in such subjects as mathematics, physics, and chemistry. Now this is a very desirable phenomenon for the individual who may not be president of his class but becomes the valedictorian. It is also fortunate for the profession and for the general public. Otherwise we could not recruit

nearly enough chemists.

At the same time we should be willing to admit that chemists as a group can benefit to an unusual degree from conscious efforts to improve in the direction of public relations in which we are, on the average, somewhat weak. This constitutes, as I conceive it one of the most important reasons for the existence of THE AMERICAN INSTITUTE OF CHEMISTS.

While chemistry has for years held a fascination for the introvert, a continually higher proportion of the simple problems pass into the "solved" category. More and more of our research now deals with subjects which can be attacked efficiently only by the team approach. Never before have public relations been so vital to the chemist and this aspect of our professional life seems certain to increase in importance in the foreseeable future.

Transferred: Dr. L. P. Moore, F.A.I.C., from American Cyanamid Company's Stamford Laboratories to the Plastics and Resins Division of the company at 30 Rockefeller Plaza, New York 20, N. Y., where he is assistant general manager.

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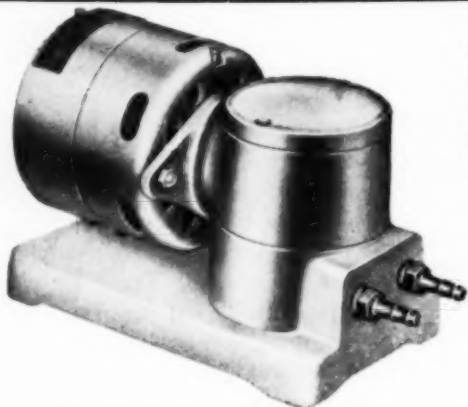
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Registers: Of Scientific and Technical Personnel are now being compiled by four professional societies with support from the National Science Foundation. These are the American Geological Institute, the American Institute of Biological Sciences, the American Veterinary Medical Association, and the Federation of Associated Societies for Experimental Biology. Additional societies that have indicated a desire to participate in the program include the American Mathematical Association, the American Institute of Physics, the American Chemical Society, the American Meteorological Society, and the Engineers Joint Council. The American Medical Association will cooperate with the biological societies in developing their registers. Up-to-date information on 100,000 scientists and engineers is expected to be on hand by June, 1954.

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The Creative Thinking Process

Dr. Elliott R. Danzig

Richardson, Bellows, Henry & Co., Inc., 2024 Delancey Place,
Philadelphia 3, Pa.

(A condensation of a talk presented at the 1953 Annual Meeting of The American Institute of Chemists.)

THE brain is a marvelous instrument; we have no more tapped its resources than we have tapped the potentiality of the seas. You may be impressed with the thousands of electronic tubes that work in giant computing machines, but the average human brain has 14-billion nerve cells! Consider the enormity of the possible combinations — the unique patterns that can provide new and creative ideas to the *nth* power.

In the past we have accepted the creative mind as a kind of unexplainable gift to the human race. Today, however, many agree with Dr. Maurice Nelles, director of Borg-Warner's Central Research Laboratory, who makes a strong case for what he calls "deliberate creativeness" in science and engineering. (See JUNE CHEMIST.) Training programs in creative thinking have been given to executives in many companies. *They show clear evidence that individuals can increase their creativity!* Certain stages in creative thinking are recognizable. The states, although not inevitably in this order, are these: Motivation, Definition, Preparation, Wildness, Frustration, Diversion, In-

sight, Verification, and Modification.

Philosophers, scientists, artists, painters, writers, in fact almost all who have turned their attention to the nature of creative thinking, have agreed that one must first be motivated. In the words of Yale's famous philosopher, Dr. F. C. S. Northrop, "when old concepts start conflicting with data we get a thorn in the flesh which is essential to imaginative thinking." A person who completely accepts the *status quo* does not have the proper motivation for pursuing a problem to the point where he can experience an illuminating new idea.

The second and one of the most important stages in creative thinking is the definition stage. It is at this stage that we need to break the fetters of our emotions and conventions. We must ask ourselves time and again what really is the problem, what are the actual boundaries, what are the only essential rules that must be followed. For example, you may be familiar with the celebrated nine-dot problem. Here are nine dots arranged in the form of a square

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Problem: to connect all the

dots by drawing four straight lines without removing the pencil from the paper. Most people try to do this within the boundary of the nine dots although there is nothing stated in the rules of the game requiring this limitation. The solution requires that some of the lines extend into the empty space outside the dots. So long as we impose a limitation that is not actually part of the problem we can never solve this problem. When we are able to recognize and dismiss inappropriate limitations, then we are prepared to move ahead toward the solution. At this definition stage we must avoid the trap of Aristotelian logic which tends to simplify to the point of confusion by "either-or" assumptions. When we say a thing is black or white, true or false, we are likely to have to qualify to such a point that we find the two-valued system worse than useless when we want to be creative. Thus a group of executives in a creative thinking session originally defined their problem as one of getting rid of the poor morale in a department. Careful examination of the problem in its definition stage revealed that (1) the world "morale" meant different things to each member of the group of executives, (2) the members of the department differed tremendously as to the extent of their so-called poor morale and (3) there was no measurement of morale in other departments to provide a comparison

that would justify the adjective used.

The third stage in creative thinking is preparation. At this point, all available information related to the problem needs to be collected and considered. Some authorities contend that too much of this type of preparation is likely to inhibit imagination and innovation. However, it is clear that *one must become thoroughly immersed in the problem, must in a sense live with it and struggle with it in order for truly creative ideas to evolve*. When the so-called logical solutions have been exhausted without the emergence of one that is completely satisfying, it is time to move on to what we may term the unconfined or wild thinking stage.

At this point the individual must break the fetters of conformity and convention and let his imagination soar. He must deliberately forego the critical aspects of his thinking and try to write down as many wild and unusual solutions as he can.

In guided sessions of creative thinking, a group of executives tackled as a sample problem, "How to Eliminate Dishwashing." They filled three blackboards with suggestions. One of the most imaginative solutions was that plates be created of a ceramics material which could be easily refired. All of the plates with their refuse would at the conclusion of a meal be swept into a container which could be left on the doorstep, and the ceramics company

THE CREATIVE THINKING PROCESS

could routinely pick up the container for refiring, leaving in its place newly fired dishes. A ceramics engineer subsequently reported that this idea was not actually wild but had very practical possibilities. The wild solution that won the prize for the day, however, was that the plates be made of a gelatin substance and at the conclusion of the main course the plates be eaten for dessert. This seems ridiculous, but this is exactly the same idea that netted an Italian chef a large sum of money for his invention of the ice cream cone!

When the individual feels that he has exhausted his wild imaginings, he should turn to his suggestions and review them somewhat critically in the light of his definition. If insight does not come at this stage, one experiences an emotional feeling which is quite characteristic — frustration. If we recognize that the feeling of frustration is a natural stage in the problem-solving process, then we may purposefully divert our attention from the problem. This diversion stage need not be thought of as one of complete inactivity insofar as the problem is concerned — it is apparent that our mind unconsciously continues to operate on the subject though we may be turning consciously to other interests.

From the diversion stage of the process we can hope to come to the exciting and sudden illumination stage — that moment of insight which

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has been described as having come to Archimedes when in his bath he hit upon the solution to the problem involving displacement of water and, according to legend, sprang up naked from the tub to run out shouting "Eureka!" Platt and Baker some years ago conducted a survey among American men of science and reported that 85 percent of the 232 research laboratory directors answering their questionnaires had experienced and been helped by this phenomenon of insight. "Insight," says Dr. Elliott Hutchinson, who has conducted considerable research in the area of creative thinking, "is one of the most recurring facts of creative life, supported by more evidence than almost any other aspect of the creative mind". Sometimes this stage appears in defining a problem, as in the case of a sudden recognition that one is not restricted to the nine-dot boundary. Sometimes it is a series of insights leading to the final creative product. There is a tendency for one, experiencing this phenomenon, to

think that this is the final answer. Here is where the scientist, the true inventor, brings to bear his critical judgment and so distinguishes himself from the crackpot. At the verification stage, the individual carefully, cautiously, conservatively assesses the insightful idea in the light of the problem. The modifications which are essential may also involve creative thinking — and so the process continues.

A research laboratory that would maintain a high level of creative thinking among its staff would do well to consider (1) that creative thinking flourishes best in a climate where wild ideas are encouraged and (2) where the staff is constantly reminded to be on the alert for the exceptions, the unusual, the non-conforming — and is encouraged to pursue assiduously the questioning of established principles and dogma.

The individual should be aware that he may follow intentionally the stages of creative thinking to solve not only his scientific problems but many of his problems of everyday living.

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Chemists' Salaries: As given in the Bureau of Labor Statistics Bulletin No. 1132, "Manpower Resources in Chemistry and Chemical Engineering," (112-pp. Superintendent of Documents, U.S. Gov. Printing Office, Washington, D. C. 50-cents) show the median annual professional income to be \$5,500 for chemists and \$5,600 for chemical engineers in mid-1951. Chemists under twenty-five years of age had a median income of \$3,400; in the older age groups median earnings increased to a peak of \$7,900 for chemists between 55 and 60. For chemical engineers under 25, median income was \$3,700, rising to \$11,700 for those between 60 and 64 and a still higher figure (\$15,000) for the very small number of engineers aged 65 or over who supplied income information. Ph.D.'s had higher average earnings than persons whose highest degree was the B.S. The Bureau of Labor notes that earnings have undoubtedly risen since the time of the survey — 1951.

Announced: By Standard Oil Development Company, 15 West 51st St., New York, N. Y. a new process, Fluid Coking, to produce more gasoline and home heating oil from crude oil. The process was under development for over four years at the Esso Laboratories, Baton Rouge, Louisiana.

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The Need for Plastics Engineers

"The survey which (was) recently carried out among members of the plastics industry has shown: that already there is a large unfilled demand for technical personnel with plastics engineering training, even though a really progressive plastics industry has been going for only a relatively short time. This demand is bound to become much greater . . . The 1952 production (of plastics) was 2.6 billion pounds (double the 1947 level and six times the 1942 total) and by 1955 the rate will almost double again the 1952 capacity. Estimates by the President's Materials Policy Commission, the Paley Commission, indicate a thousand per cent increase during the next twenty-five years . . . It is evident that the demand for plastics engineers and other scientists trained in the plastics field will continue to rise sharply.

"Another factor . . . is that, as in the case of the chemical industry generally, the demand for technically trained people relative to non-technically trained personnel increases as the industry becomes older . . . As the industry becomes more mature the new technical developments take on greater significance relative to the original empirical approaches . . .

"Qualified technical personnel with plastics engineering training are considered . . . to be of special value in all phases of the plastics industry,

including research, development, product design, production, production control, technical services, technical sales, and probably direct sales . . . Depending upon a person's individual aptitudes or interests he may go into any of the areas mentioned but still the basic information on plastics would certainly be valuable and helpful."

—E. S. BLOOM at the Education Forum of the Society of Plastics Engineers.

Memorandum

The report of the Committee on National Legislation Affecting Chemists, appearing on pages 356-360 of the July, 1953, issue of THE CHEMIST, notes as follows:

"The Social Security Law, as amended in 1950, excluded self-employed professional engineers from the benefits of the law. By a ruling of the Deputy Commissioner of Internal Revenue 'professional engineer' is interpreted to include self-employed chemists."

The second sentence is misleading. It should have read:

"By a ruling of the Deputy Commissioner of Internal Revenue, the Social Security Law has been interpreted as including self-employed chemists."

Under this ruling of the Deputy Commissioner of Internal Revenue, self-employed chemists come within the provisions of the Social Security Law; professional engineers do not.
—LOUIS N. MARKWOOD, *Chairman*
Committee on National Legislation Affecting Chemists

Consulting Firms Offer Careers, Too!

Richard L. Moore, F.A.I.C.

*Director of Personnel, Foster D. Snell, Inc.,
29 W. 15th St., New York 11, N. Y.*

(Excerpts from a talk given before the Chemistry Club of Polytechnic Institute of Brooklyn.)

TO THE man just out of school, the consulting firm is a form of graduate school on an applied research basis. It offers the young chemist much the same opportunity that a law office offers the law graduate; the accountant offers the CPA candidate, or the hospital offers the intern. However, the starting salary for the chemist is higher than in the others fields — there is more competition for him because there are so many industries he can enter!

The consulting firm has generally started from a one-man organization, which over the years has expanded with the chemical industry. Our own organization follows the pattern of slow but continuous growth, so that while one segment of our work may have reached its peak or even declined, another department begins to grow. Thus over the past five years, we have developed an organoleptic panel that embodies the use of chemistry, physical science, human senses, and statistical analysis in evaluation of products to determine consumer acceptance and preference; we have

acquired a vitamin-assay laboratory in order to run Vitamin D and multi-vitamin assays on milk; we have established a radiochemistry laboratory and this year will report to our client on findings about how to remove radioactive contaminants from the skin; we have established a packaging laboratory in order to expand into the field of shock and vibration as it affects packaging of materials and instruments. These new endeavors are being built up gradually in order to take their place with the other services. Expansion by adding departments is one factor in possible growth. Another is that new problems are constantly coming up and so it is possible to build up a backlog of services to be rendered. The consultant must continue to build prestige and turn out exemplary work that will enhance his reputation. He must publish papers, write books, give lectures, and in general dangle his new mouse-traps in front of people so they won't forget to beat a path to his door.

The consultant needs three types of technical men: Trained idea-men

to undertake and guide basic research; applied research and development men, and product-evaluation men.

Idea-men can be classified as research executives who think of research projects in broad terms and who can apply a practical solution they have used for one set of problems as a basis for undertaking a solution in an entirely different field. To illustrate, the physical chemist may apply his knowledge of surface chemistry to determine how to get better sudsing action out of a detergent in hard water. Days later, he may sit in conference with a man who has the problem of removing coffee stains from plastic cups, and he then applies his knowledge in a different direction. If two specialists, like one in wax research and another in toxicology, get together in a conference calling for some ideas on how to undertake a program to develop a new self-polishing bactericidal coating for maintaining relatively germ-free conditions on hospital floors and walls, it is possible that many good ideas will be reawakened or just born. Each experienced man will suggest ideas that will stimulate the thinking of his associates and can provide some novel and practical approach to problems that may have only hit dead ends up to this time. These are idea-men. It takes years to develop them.

Research and development men are those who are trained to conduct the

program that is planned and executed by the research director or ideaman. They are the men trained to set up experiments and observe the reactions. Not only should they have a well-organized grasp of the background of their work, they should continually watch for unexpected events that might be the key to solving the problem or suggestive of another avenue of approach. This analysis of what a researcher does is rudimentary. It is merely one of the classifications you could use to define the research chemist. Some men just out of school can be integrated into this work.

The product-evaluation men may be classed as test engineers. These men are those who find what is good or bad about a product; how it compares with another product; what its shelf-life or stability to storage is; how many hours it takes to break down or oxidize; how cold it can get before its composition changes; whether it exhibits qualities that make it a good plasticizer, or literally thousands of questions which help to uncover the performance or physical characteristics of a product. Men right from school or with only a few years of experience can be adapted to this work readily.

Consulting is challenging because it demands that you learn quickly about many problems. Leadership, or a well-rounded personality, are assets in getting ahead, because you are

CONSULTING FIRMS OFFER . . .

continually dealing with clients. In a sense you become something of a salesman. Then too, you are given responsibility as early as you are able to take it on. Your progress depends on your ability to carry out the work assigned with as little supervision as possible, because executive time is the scarcest commodity in a consulting organization. The expression, "there is always room at the top" is very true in this field. The more the executive is freed from routine supervision which he attempts to delegate, the more time he can spend in building his business.

The consulting organization demands more of its people because its clients must feel that the service they get cannot be duplicated by themselves. Clients are research-dollar conscious and usually purchase services on a month-to-month or so-many-dollars for this project basis. Therefore, the new employee has to learn to work under pressure from the day he starts. This pressure demands that he continue to build himself by taking evening courses, that he attend technical lectures and meetings, that he learn to utilize his time and that he meticulously see that he is rendering satisfactory service.

The job expects you to be above average. It places the challenge of security in your hands because you have to produce and keep producing. Almost any consulting organization will allow you time and adjust your

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schedule so that you can continue your studies to broaden yourself in order to keep abreast of new developments.

Here is what the job can offer you:

Faster advancement because most consultants try to close ranks from within.

A chance to study a multitude of industrial problems, thereby increasing your value to the organization and to the industry. By the nature of the work, it overcomes some of the big objections we hear from prospective employees: That their present job is simply continuous quality control, or is "too routine", or "is a blind alley;" "There was no chance for advancement," "my company was not research minded, it just put up with us," or "I was not learning anything and felt I'd be doing the same thing for the next fifty years."

Recently a research chemist came in for an interview and could not even tell me the trade name of the

product he knew only as a certain type of plastic adhesive. To him it had only been a batch number. He had been there a year and yet his company had not bothered to acquaint him with the product it marketed. Certainly here was a case of poor personnel relations because of the limitations placed on this man's development in the company. In consulting, the understanding of the desired end result is almost as essential as the work itself.

The variety of subject matter can be stimulating. In the applied research programs that we encounter, we may take a development from the idea through to pilot plant production. Many times we see the development placed in production and eventually marketed by the client. Sometimes we run a consumer evaluation program on a product we have developed or run a market research survey on a basic raw material in order to find new markets or new uses. We are a service organization adaptable to many aspects and phases of situations as they arise.

Before a department becomes well-established, its new men may be transferred or loaned to other departments for temporary duty. Sometimes men will be loaned because another department has a rush job that demands temporary additional personnel. Each new assignment carries the opportunity to see other problems and how they are handled. Sometimes a depart-

ment finds that the temporary man shows greater aptitude for the new type of work and a permanent switch is arranged. We have some men who remained free-lance because they fit into several groups and find themselves in a continuous state of demand for their services.

The consultant offers his technical employee the opportunity of being a bigger fish in a smaller pond. Consulting offers the security of being in many fields of chemistry rather than just one. All too often we hear of the lopping off of a research budget program because the company had a bad year or that particular industry was in its doldrums. We just received a letter from a large paper company in Maine which said that the research staff had been given notice and men were available with backgrounds in various types of paper and cellulose chemistry. My point is that the well-integrated consultant, because of his heterogeneous qualities, is never dependent on one industry.

Going a step farther in economics, depressions may affect the chemical consultant but while he may have to pull in his belt a notch or two, he will continue to serve those companies that have cut technical people off their budget, but still have occasional research development or testing to do.

There is a healthy turnover in consulting organizations for men on their way up, because of the fact that the training received as a "graduate"

CONSULTING FIRMS OFFER . . .

makes the man sought after by industry because of his diversified and practical knowledge. Our own organization has sixteen group leaders, each directing the work of three or more persons. Ten of these group leaders have been with the organization less than ten years. Their average age is thirty-six. All of them handle research budgets in the range of \$50,000 to \$75,000 annually and are responsible for the success of these programs. Twelve of these sixteen positions have been filled through the ranks. If any of these men and women left us, the organization would first see if there were someone in the group who could move up. In

effect, each man is his own boss running his own group as though it were his own business. All take part in executive committee meetings that help formulate the policy of the organization, and they have their say in the management of the company.

Of course, the business must exist in interchange of personnel, ideas and joint research and promotional efforts. Like any business, it has its problems, its politics, its grapevine, and its personalities, but the spirit of freedom that pervades the atmosphere is one of the big factors in its growth curve that has been climbing steadily at a rate of between fifteen to twenty per cent per year.

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"Education for Your Career in the Pulp and Paper Industry." Booklet. University of Maine, Orono, Maine.

"Your Future with B. F. Goodrich." Booklet. B. F. Goodrich Co., Akron, Ohio.

"Opportunities for You with Standard Oil." Booklet. Employment Division, Standard Oil Co., (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.

"Scholarships, Fellowships, and Loans, S. N. Feingold. (Query for price). Bellmann Publishing Co., Inc., 83 Newbury St., Boston 16, Mass.

"Scholarships and Fellowships Available at Institutions of Higher Education," Bulletin No. 16, 1951, U. S. Office of Education. Order from Superintendent of Documents, Gov. Printing Office, Washington 25, D.C. 55¢.

"Study Abroad, International Handbook, Fellowships, Scholarships, Educational Exchange," Vol. V, 1952-1953, UNESCO, 19 Avenue Ickeber, Paris XVI, France.

"Federal Funds for Scientific Research and Development at Non-profit Institutions, 1950-51 & 1951-52." 30¢. Superintendent of Documents, U. S. Gov. Printing Office, Washington 25, D. C.

"NCE Today." Folder. Newark College of Engineering, 367 High St., Newark 2, N. J.

"X-ray Methods of Possible Use in Clinical Laboratories." Booklet. North American Philips Co., Inc., 750 South Fulton Ave., Mount Vernon, N. Y.

"Cenco Balances." Bulletin 15C. Central Scientific Co., 1700 Irving Park Road, Chicago 13, Ill.

"Plastic Pellets." Booklet. Flash-Stone Co., Inc., 3723 Pulaski Ave., Philadelphia 40, Pa.

"Frahm Resonant Reed Hand Tachometers." Bulletin 31-p8. James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

"Glove Dryer Preserves Rubber Gloves for Longer Wear." Information. General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa.

"How Automatic Can We Get?" Booklet. Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.

"Custom Built Stainless Steel Tanks." Bulletin G-479. Cherry Burrell Corp., Dept. AS-7, 427 W. Randolph St., Chicago 6, Ill.

"Cosmetic and Drug Manual." Glyco Products Co., Inc., 26 Court St., Brooklyn 1, N. Y.

"Bristol Electronic Dynamaster Recording Potentiometers." Bulletin P1255. The Bristol Co., Waterbury 20, Conn.

"Memory Card File System." Information. Picturesort Co., 246 Church St., New Haven 10, Conn.

"Eclipse Oil Reducing Valves or Regulators." Bulletin. Eclipse Fuel Engineering Co., Rockford, Ill.

"High Resolution N-M-R Spectrometer." Folder No. 70. Varian Associates, 611 Hansen Way, Palo Alto, Calif.

Starting Salaries

It's no longer fashionable, according to (Columbia) University's placement director, Samuel Beach, for graduates to search out engineering jobs. Without leaving the campus they can have their choice of two, three, or even more. Here is his rough table of beginning monthly salaries being offered engineering and pure science graduates:

Degree	Pay Range	Average
B.S.	\$350—\$425	\$375
M.S.	\$350—\$450	\$400
Ph.D.	\$525—\$600	\$550

—Columbia Research News



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National Council Meetings

Meetings of the AIC National Council are scheduled to be held at The Chemists' Club, 52 East 41st St., New York, N. Y., at 6:00 p.m., on the following dates:

Nov. 11, 1953

Jan. 13, 1954

Mar. 10, 1954

Apr. 14, 1954

September Meeting

The 291st meeting of the National Council was held September 16, 1953, at The Chemists' Club, New York, N. Y. President L. T. Work presided. The following officers and councilors were present: C. C. Concannon, H. L. Fisher, P. J. Gaylor, F. A. Hessel, M. J. Hiler, D. B. Keyes, J. H. Nair, D. Price, C. L. Thomas, L. Van Doren, F. E. Wall and L. T. Work. K. M. Herstein, chairman of the New York Chapter, H. A. Neville and B. Sweedler, Committee chairmen, and V. F. Kimball were present.

The New Jersey Chapter extended an invitation to the Institute to hold its 1954 Annual Meeting at the Berkeley-Carteret Hotel at Asbury Park, N. J., and

this invitation was accepted. Tentatively, Chicago was selected for the 1955 Annual Meeting, and Washington, D.C. for 1956.

Dr. Fisher reported that the Los Angeles Chapter planned four meetings during the year.

Mr. Herstein announced that the first meeting of the New York Chapter would be held Oct. 22nd, at which Dr. Walter R. Smith, F.A.I.C., would speak. The Chapter is encouraging younger members to participate actively.

Dr. Work announced that Honorary AIC membership would be presented to Dr. Ray P. Dinsmore, F.A.I.C., under the auspices of the Ohio Chapter, at Akron, on Oct. 30th.

At the first fall meeting of the New England AIC Chapter, Honorary Membership will be presented to Dr. Walter G. Whitman (November 18th).

The application of the Los Angeles Chapter for a change of name to the Western Chapter was approved.

President Work stated that the Honor Scroll of the Chicago AIC Chapter would be presented to Dr. Hilton Ira Jones, F.A.I.C., October 9th.

Miss Wall was appointed delegate to represent the Institute at the commemorative exercises to be held at New Rochelle College.

The Secretary reported that membership in the Institute totals 2565. He recorded with deep regret the death of the following Fellows: J. A. Lutz, Henry F. Muer, and Alfred M. Peter, a Charter Member. A moment of silence was held in honor of these members.

A letter from the Secretary of Agriculture was presented, requesting that the AIC cooperate by giving its view in connection with research affecting the farm program. The President was requested to appoint a special committee to consider this subject.

Mr. Sweedler reported that hearings on the Jenkins-Keogh Bills would probably be held in October.

Mr. Nair discussed the current activity of the Committee on Membership.

Dr. Keyes emphasized that it is important for young people to join the Institute and work actively for it.

The Secretary was requested to send to the Chapter Chairmen copies of the proposed revision of the Constitution and By-Laws. Chapter Chairmen were to be asked for their comments.

Dr. Neville discussed several projects that might be interesting to the Institute in connection with the education of chemists.

Dr. Keyes, reporting for the Committee on Manpower, stated that we have no general shortage of chemists and chemical engineers, but that we want to encourage those persons who are qualified by natural aptitudes to take up chemistry.

President Work announced that the Bureau of Standards affair was settled satisfactorily in line with the AIC recommendations.

President Work was given approval to appoint a Committee to accelerate a public relations program.

The following new members were elected:

FELLOWS

Andersen, Bjorn

Vice-President, Technical Director, Celanese Corp. of America, 180 Madison Ave., New York, N.Y.

Behney, Dale F.

Sales Manager, Harwick Standard Chemical Co., 60 South Seiberling St., Akron 5, Ohio.

Bohrer, John J.

Assistant Director of Research, International Resistance Co., 401 North Broad St., Philadelphia 8, Pa.

Byrnes, Frank C.

Midwest Editor, *Chemical Week and Chemical Engineering,* McGraw-Hill Publishing Co., 520 North Michigan Ave., Chicago 11, Ill.

Coyle, Theodore G.

Vice President, United Chromium, Inc., 100 East 42nd St., New York 17, N. Y.

Dunlap, Lawrence H.

Assistant Manager, Chemical Department, Armstrong Cork Co., Research and Development Center, Lancaster, Pa.

Hawkes, Benjamin Guilford

Director of Research, Roux Labs., Inc., 1841 Park Avenue, New York 35, N. Y.

Hickson, John L.

Assistant to the President, Sugar Research Foundation, Inc., 52 Wall St., New York 5, N. Y.

Hinton, Robert C.

Vice President, The Cleveland Electric Illuminating Co., 75 Public Square, Cleveland 1, Ohio.

COUNCIL

Hollis, Arthur L.

Consultant, Office of Synthetic Rubber, RFD, 811 Vermont Ave., N.W., Washington, D.C.

Morrisroe, John

President, Pilot Chemical Co. 11738 Sorenson Lane, Los Nietos, Calif.

Overberger, Charles G.

Professor of Organic Chemistry, Polytechnic Institute of Brooklyn, 99 Livingston St., Brooklyn, N. Y.

Shown, John H.

Senior Chemist, Process Development, General Aniline & Film Corp., Grasselli, N. J.

Somerwine, Elbert Orla, Jr.

Project Engineer, Wigton-Abbott Corp., 45 Academy Street, Newark 2, N. J.

Stahly, Eldon E.

Director of Research, Burke Research Co., 11281 East Nine Mile Road, Van Dyke, Mich.

Stubbings, Robert L.

Director, Division of Leather Tech., Institute of Research, Lehigh University, Chemistry Department, Bethlehem, Pa.

Wafer, Joseph M.

Industrial Chemical Sales Division, West Virginia Pulp & Paper Co., 230 Park Ave., New York 17, N. Y.

Weber, Ernest M.

Director of Biochemistry, Research & Development, Charles Pfizer Co., Inc., 630 Flushing Ave., Brooklyn 6, N. Y.

Welch, David Edgar

Technical Representative, Rubber Chemical Sales, Naugatuck Chemical Division, U. S. Rubber Co. Naugatuck, Conn.

Williams, Martin Barbour

P.O. Box 215, Centreville, Ala.

Winston, James J.

Director, Jacobs-Winston Labs., Inc., 156 Chambers St., New York 7, N. Y.

MEMBERS

Hershenson, Herbert Malcolm

Assistant Professor, Hall Chemistry Lab, Wesleyan University, Middletown, Conn.

Le Fave, Gene M.

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ASSOCIATE

Siomkajlo, Julian Michael

Research Chemist, Columbia University, 632 West 125th St., New York, N. Y.

REINSTATED TO FELLOW MEMBERSHIP

DeMelfy, Frank A.

2748 Charlotte, Kansas City 3, Mo.

Reed, Burleigh

Professor of Chemistry, Dept. of Chemistry, Washburn Municipal University, Topeka, Kans.

Robertson, Clifford J.

1002 Mary Lane, Cincinnati 15, Ohio.

Schuyten, Hartwig Andrew

Chief Chemist, Southern Regional Research Lab., 2100 Robert E. Lee Blvd., New Orleans, La.

RAISED FROM MEMBER TO FELLOW

Walker, William Comstock

Associate Director, National Printing Ink Research Institute, Chemistry Department, Lehigh University, Bethlehem, Pa.

To Utah: A. L. Forchielli, A.A.I.C., formerly group leader, Chemical Research Section, Picatinny Arsenal, Dover, N. J., now research director, Sure-Seal Corporation, Salt Lake City, Utah.

AIC Activities

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New Jersey Chapter

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Peter J. Gaylor

Atomic Tests

At the October 20th meeting of the Chapter, Charles W. Dorn, head of the research laboratory of J. C. Penney and Company, discussed, "Textiles and the Atomic Tests of March 17, 1953." Illustrating his talk with slides and movies, Mr. Dorn demonstrated that the only protection afforded by clothing consists in reflection of the heat generated by an atomic blast up to a certain point. Department store dummies dressed in a variety of wearing apparel were exposed to the March 17th blast under varied conditions (in cars, homes, bomb shelters, etc.) and the before and after pictures provided a graphic illustration of the effects. Hippolyte Kamenka, chairman of the Committee on Civilian Defense of the American Institute of Architects, discussed "Bomb Shelters." A veteran of the London blitz during World War II, Mr. Kamenka presented a very realistic pictures of the effects of bombing on residential buildings and pointed out numerous features that must be considered in the construction of a worthwhile bomb shelter.

The next meeting of the Chapter is tentatively scheduled for January 19th, when the speaker will be E. C. Easton, dean of the College of Engineering, Rutgers University, on "The Effect of Supply of Energy on World Civilization." This will be ladies' night and members are urged to bring their wives for dinner and the meeting.

New York Chapter

Chairman, Karl M. Herstein
Vice Chairman, Savery F. Conebear
Secretary-Treasurer, Richard L. Moore
Representative to National Council,
Dr. Maurice J. Kelley.

How to Improve Technical Writing

"How to Improve Your Technical Writing" will be the subject of the Second Annual jointly-sponsored meeting of the New York Section of the American Chemical Society and the New York AIC Chapter. Robert Gunning of Robert Gunning Associates will address the meeting for one hour on this subject. A question-and-answer period will follow. The author's paper on "How to Improve Your Technical Writing" will be distributed free.

All technical people are invited, members as well as non-members, particularly those engaged in technical activities and those majoring in technical subjects in colleges and universities.

The meeting will be held at the Union Carbide & Carbon Cafeteria, 30 East 42nd Street, New York, N. Y. Informal dinners at either 75 cents or \$2.75 will be served at 5:45 p.m. Refreshments will be served after the question-and-answer period to give opportunity for social visit.

Make your reservations before December first with Dr. John A. King, Warner-Hudnut, 13 W. 18th St., New York 11, N. Y. (WAtkins 4-7700). The Committee suggests that ACS and AIC members register at their respective desks. Space will be provided at these desks for non-members and students to register. For additional information, please contact the General Chairman, John Kotrady of The Texas Company, MUrray Hill 9-7700.

Pennsylvania Chapter

Chairman, Dr. Walter W. Thomas
Vice Chairman, Dr. Robert Kunin
Secretary-Treasurer, John H. Staub
Representative to National Council,
Marcus Sittenfield

Honor Scroll Award

The Honor Scroll of the Pennsylvania AIC Chapter will be presented on December third to Dr. Hugh W. Field, vice president and manager of research of The Atlantic Refining Company, at a meeting at the Penn-Sheraton Hotel, 3900 Chestnut St., Philadelphia. A reception will be held at 6:30 p.m. through the courtesy of Atlantic Refining Company, followed by dinner at 8:00 p.m. Henderson Supplee, Jr., president of Atlantic Refining, will

AIC ACTIVITIES

speak for the recipient. AIC President Work will make the presentation. Reservations should be made with Dr. C. Harry Neufeld, P.O. Box 210, Plymouth Meeting, Pa. (Chestnut Hill 9-5800, Ext. 32). Subscription \$5.00.

Western Chapter

Chairman, Peter J. Stupin
Vice Chairman, Dr. Kenneth Newman
Treasurer, Carleton F. Smith
Secretaries, Miss Blanche C. Simons
Tom Rollins
Representative to National Council,
Dr. L. F. Pierce

Around the World for M.S.A.

(A report of a talk delivered by Dr. Robert E. Vivian, dean of the College of Engineering, University of Southern California, at a meeting of the Western Chapter in Los Angeles, Oct. 1, 1953.)

Funds being spend under the Mutual Security Agency are doing an effective job in helping the economy of many foreign countries, Dr. Vivian emphasized in his address.

Between February and August, 1952, Dr. Vivian was on leave from the University on a tour of duty for the Mutual Security Agency of the U.S. Government in Europe. As chemical production specialist for M.S.A. with an office in Rome, he traveled over much of Italy inspecting chemical plants and advising on chemical problems. Eventually most of his work centered on plants designed for the production of smokeless powder and explosives. Many of these were still idle after being damaged during World War II.

As a result of M.S.A. activity, orders were placed for \$100,000,000 worth of ammunition for NATO armies in Italy under the Off-shore Procurement Program, thus helping to re-establish the Italian munitions industries. While on this project, Dr. Vivian worked closely with the Italian people and was able to observe the economical and political conditions in many places seldom visited by tourists.

In January 1953, Dr. Vivian was again called upon by M.S.A. to do similar urgent work in Asia. When he returned to Los Angeles in May, he traveled over 30,000 miles by air and worked in Japan, Formosa, Malaya, and Thailand on smokeless powder, explosives, and chem-

ical production problems. He returned through India and Europe to Washington for final conferences and reports.

The crucial struggle between Communism and Democracy in southeast Asia has made Thailand of special importance. This nation is a bulwark against the spread of Communism and deserves continuing attention under the M.S.A. program. Throughout his talk, Dr. Vivian emphasized the important part that chemists and chemical engineers were playing in rendering technical support to the ideological struggle throughout the world.

Will You Come

Nov. 11, 1953. Ohio Chapter jointly with the Cleveland Section of the American Chemical Society, Alpha Chi Sigma, The Electrochemical Society and the American Institute of Chemical Engineers, Hollenden Hotel, Cleveland. Annual dinner of the Chemical Profession in Cleveland. Speaker, Prof. Harold C. Urey, The Institute of Nuclear Studies, University of Chicago, "Cosmic Chemical Engineering."

Nov. 18, 1953. New England Chapter. Faculty Club, MIT. Presentation of Honorary AIC Membership to Prof. Walter G. Whitman, head Dept. of Chemical Engineering, MIT. Social Hour 6:00 p.m. Dinner 7:00 p.m. Speaker: Earl P. Stevenson, president, Arthur D. Little, Inc. Dr. L. T. Work will make the presentation.

Dec. 3, 1953. New York Chapter. Joint meeting with American Chemical Society. Dinner at Carbide & Carbon Cafeteria, 30 East 42nd St., New York, N. Y. 5:45 p.m.; Program 7:30 p.m.; Question-and-Answer Period 8:30 p.m.; Refreshments, 9:00 p.m. Speaker: Robert Gunning of Robert Gunning Associates, Inc. "How to Improve Your Technical Writing." Reservations: (Dinner either 75¢ or \$2.75) Dr. John A. King, Warner-Hudnut, 13 W. 18th St., New York 11, N.Y. (WAtkins 4-7700).

Dec. 3, 1953. Pennsylvania Chapter. Penn-Sheraton Hotel, Philadelphia. Honor Scroll Award to Dr. Hugh W. Field, vice president and manager of research, Atlantic Refining Co. Speaker: Henderson Supplee, Jr., president, Atlantic Refining Co. Dr. L. T. Work

will present the Scroll. Reception 6:30 p.m. Dinner, 7:15 p.m. Subscription \$5.00. Reservations: Dr. C. Harry Neufeld, P.O. Box 210, Plymouth Meeting, Pa. (CHestnut Hill 9-5800, Ext. 32).

Jan. 19, 1954. New Jersey Chapter. Speaker Dr. E. C. Easton, dean, College of Engineering, Rutgers University, "The Effect of Supply of Energy on World Civilization." For information: Dr. W. R. Sullivan, Hoffmann-La Roche, Inc., Nutley 10, N. J.

May 12, 13, 14, 1954. Annual Meeting, THE AMERICAN INSTITUTE OF CHEMISTS, Berkeley-Carteret Hotel, Asbury Park, N. J. The New Jersey AIC Chapter will be our host.

Opportunities

Doris Eager, M.A.I.C.

Positions Available

Chemist or Chemical Engineer. Experienced in oil refining to act as technical director for small company. Salary \$6,000-\$8,000. Metropolitan New York Area. Box 111, THE CHEMIST.

Technical Salesman: Graduate chemist or chemical engineer with experience in such metal working operations as machining, grinding, drawing, cleaning and corrosion prevention, for chemical manufacturer in Philadelphia area. Salary \$6,000-\$8,000 plus bonus. Box 113, THE CHEMIST.

Technical Director: For old, well-established firm in pharmaceutical industry, to have responsibility for technical function of company and to report directly to chief executive. The directors of these departments will report to technical director: Research, Pharmacology, Process Development, and Medical. Over 38. Ph.D. desirable. At least 5 years' administrative experience in ethical drug field and understanding of clinical testing, quality control, process engineering, and market possibilities. Box 115, THE CHEMIST.

Positions: At the new Research & Development Laboratories, Office of the Quartermaster General, Natick, Mass.: GS-13, \$8360: Supervisory Chemist, (Adhesives, Section Chief); Supervisory Chemist (Protective Finishes, Section Chief); Supervisory Technologist (Paper & Paper Products, Section Chief). GS-12, \$7040: Technologist (Test Coordinator, Chief). GS-11 \$5940: Chemist (Protective Finishes); Biologist (Insecticides & Rodenticides); Physicist (Materials Evaluation); Chemist, (Films, Filaments & Coated Fabrics); Physicist (Personnel Armor); Technologist (Specifications Office). GS-9, \$5060: Technologist (Films, Filaments and Coated Fabrics); Chemist (Insecticides & Rodenticides); Technologist (Paper & Paper Products). GS-7, \$4205: Chemist ((Chemicals & Chemicals Processes); Chemist (Fungicides & Germicides). Request Form 57 from Department of the Army, Office of the Quartermaster General, Washington 25, D. C. Forward form to Civilian Personnel Office at above laboratories.

Chemists Available

Chemist, F.A.I.C., M.S., 1940 in chemical economics. Thirteen years experience in administration, industrial planning, foreign trade, laboratory supervision. Assisted in post-war development of Japanese chemical industry. Publications. Age 36. Desires opportunity in administration, sales, public relations, market research or related field. Box 110, THE CHEMIST.

Chemist: F.A.I.C. Woman wishes position involving literature and patent surveys and searches. Abstracting, translating, compilation of chemical data. Fluent French and German. Box 112, THE CHEMIST.

Chemical Patent Attorney, D.C. Bar, former Examiner, seeks responsible position in New York city with corporation; 6½ years diversified experience, infringement investigations, applications, appeals, interferences, licensing with private and governmental agencies; 10 years engineering and research experience. Box 114, THE CHEMIST.

Communications

Ethics

To the Secretary:

My interest in the profession and in the ethics so faithfully expounded by THE CHEMIST has never abated. Indeed chemistry is coming into its own and chemists are more than "mere test tube holders and star gazers." It was the late Dr. Henry G. Knight (AIC president from 1932 to 1934) who interested me in joining with the other chemists to work together for our mutual benefit and for the elevation through the establishment of a code of ethics. My best wishes go to the profession that I served as a teacher and then as an industrial chemist in the field of Gum Naval Stores Research and Development for forty years.

—GEORGE P. SHINGLER, F.A.I.C.

Are Teachers at Fault?

To the Editor:

The alarming decrease in the number of young people preparing for professional careers in Chemistry calls for a critical examination of the methods of instruction — not alone in secondary schools, but especially in our proud colleges and universities whose smug egotism often blinds them to the fact that they are responsible for the disillusion and discouragement of many of the brightest young minds. Thus a typical uni-

versity had an enrollment of four-thousand in freshman Chemistry, and a graduate enrollment of one-hundred and sixty candidates for the Ph.D. in chemistry; but *graduated only eighteen Bachelors of Science in Chemistry*. Equally startling is the record of another great university, with approximately the same enrollments as stated above; it graduated only thirty-five B.S. degrees in chemistry, and I was told that less than half of the group intended to follow chemistry as a profession. Is the great art of teaching becoming moribund?

—DR. GEORGE A. ABBOTT, F.A.I.C.
University of North Dakota

Scholarships: Over a thousand made available during 1952-53 by chemical and related companies, according to a survey by the Manufacturing Chemists' Association, Inc. A total of thirty-four companies provided 1036 scholarships and fellowships having an annual value of \$1,168,000. This does not include funds given in the form of grants-in-aid or to support research in educational institutions. In most cases the colleges and universities pick the recipient and administer the scholarships.

Moved: The Philadelphia, Pa., sales office of J. T. Baker Chemical Company to larger quarters at 6908 Market St., Upper Darby, Pa.

Condensates

Ed. F. Degering, F.A.I.C.

Of the twenty-eight reasons for changing jobs (indicated in 422 interviews), more than 63 percent of transfers result from a desire:

1. To step up immediately to a bigger job with more responsibility.
2. To find greater opportunity for future growth.
3. To obtain increased income.
4. To terminate an unhappy situation involving policy differences.

One usually learns that most of the other fellows are as ambitious as he is, that they have brains as good or better, and that hard work, not cleverness, is the secret of success. He learns to sympathize with the youngster coming into the business, because he remembers how bewildered he was when he first started out.

—*Sunflower Planet*

Greater support of colleges and private laboratories carrying on basic research is needed to assure a continual flow of scientific reports to be used for future inventions.

—*Business Week*

TO COME

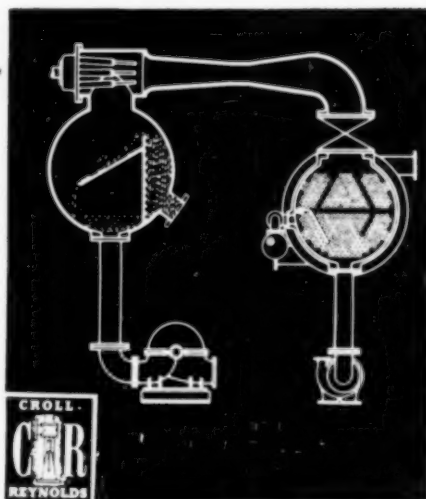
The December issue of *THE CHEMIST* will be a supplement to the November issue! It will carry additional career and professional information for which space was lacking in November. Departments omitted will be restored. M. R. Bhagwat will tell us some things he has learned about chemists. Dr. Hilton Ira Jones has provided us with his acceptance address (the Honor Scroll of the Chicago Chapter), entitled "The Chemist — Friend or Foe." Its message for peace is appropriate to this season. The New Jersey AIC Chapter proposes some problems that other Chapters will want to help resolve for the good of the profession. Other articles will reveal new fields of opportunity.

Water cools itself with a C-R Chill-Vector

A Chill-Vector is a three-stage steam-jet vacuum unit which serves to flash-cool water and certain other liquids through temperatures down to 32°F. No chemical refrigerant is used. There are no moving parts. Water literally "cools itself" by partial evaporation at high vacuum. Vacuum refrigeration is usually less expensive than mechanical refrigeration in first cost as well as operating cost.

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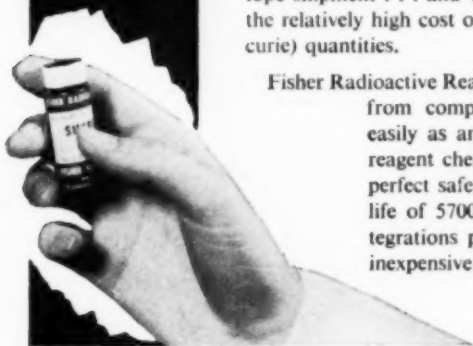
Radioactive Reagents for the laboratory ... from **FISHER**

With the recent announcement of the Atomic Energy Commission that "microcurie" quantities of long-lived radioisotopes can be transferred *without* special authorization, Fisher Scientific has made available 25 organic and inorganic reagent chemicals tagged with carbon-14.

To the laboratory world this means that tracer techniques—sensitive, simple—can now be applied to many more problems of research, analysis and control.

Previously these techniques were, of course, limited largely to laboratories engaged in research projects specific enough to receive authorization for radioisotope shipment . . . and with budgets able to include the relatively high cost of the *millicurie* (1000 microcurie) quantities.

Fisher Radioactive Reagents, which may be ordered from comprehensive Fisher stocks as easily as any of the other 6000 Fisher reagent chemicals, can be handled with perfect safety. Each reagent has a half-life of 5700 years, emits 3.7×10^4 disintegrations per second, and is relatively inexpensive (\$15 per microcurie vial).



Full information about these newest of laboratory tools is available from the nearest Fisher plant. Request bulletin FS-231-O "Fisher Radioactive Reagents."



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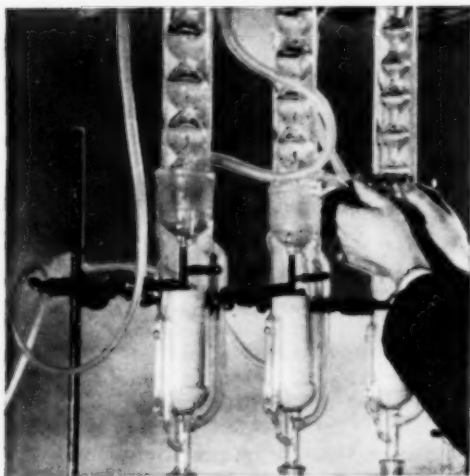
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